Claims

1. A valve assembly comprising:

a valve body defining a chamber with a controlled outlet;

a stop and a seat supported within the chamber of the valve body in axial alignment with the controlled outlet;

a plunger reciprocably movable between the stop and the seat to open and close the controlled outlet respectively; and

a solenoid assembly operable on the plunger to move the plunger between the stop and the seat, said solenoid assembly having a spool supported between a primary and secondary plate, said spool having an electromagnetic coil wound thereon for receiving electrical current and producing magnetic flux, wherein magnetic flux produced by said electrical coil flows in a primary magnetic flux flow path about said electrical coil, said primary magnetic flux flow path extending from said secondary plate through a sleeve, from said sleeve to said primary plate and through said primary plate to said plunger to said stop, and through said stop back through the secondary plate, wherein the solenoid assembly includes means for providing a secondary bypass magnetic flux flow path for a portion of the magnetic flux.

2. The valve assembly of claim 1, wherein the means for providing the secondary magnetic flux flow path includes a magnetic flux regulator to form a short cut loop to bypass the plunger.

3. The valve assembly of claim 2, wherein the magnetic flux regulator has a first end portion communicating with the primary plate and has another end portion spaced from the stop.

4. The valve assembly of claim 2, wherein the magnetic flux regulator is made of magnetic conductive material.

5. The valve assembly of claim 4, wherein the magnetic flux regulator is an annular member disposed within the spool.

6. The valve assembly of claim 3, wherein the spool has a center bore for receiving a portion of the stop therein, said stop having a conductive body with a reduced area adjacent said spool.

7. The valve assembly of claim 7, wherein the stop includes a resilient insert molded into the reduced area of the conductive body.

8. A valve assembly comprising:

a valve body defining a chamber with a controlled outlet;

plunger reciprocably movable within the chamber to open and close the controlled outlet;

a solenoid assembly operable to move the plunger upon receipt of electrical current to produce a magnetic flux having a primary path through the plunger and a secondary path bypassing the plunger.

9. The valve assembly of claim 8 further comprising means for limiting the total amount of magnetic flux produced by the electrical current.